



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

East Lansing Field Office (ES)  
2651 Coolidge Road, Suite 101  
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

October 31, 2016

Ms. Sylvia Heaton  
Michigan Department of Environmental Quality  
Water Resources Division  
Constitution Hall  
525 West Allegan St.  
Lansing, MI 48913

Re: State of Michigan File ID: 14A021. Aquila Resources, Inc.

Dear Ms. Heaton:

We have reviewed the public notice for the above referenced file concerning an application for a Michigan Department of Environmental Quality (MDEQ) National Pollutant Discharge Elimination System (NPDES) permit under the authority of Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). These comments are provided pursuant to the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the Clean Water Act section 402 (as amended; 33 U.S.C. 1251 et seq.), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, (26 U.S.C. 661 et seq.)).

According to the information provided in the public notice, the applicant proposes to develop a polymetallic mineral deposit with grades of zinc, copper, and precious metals located in Lake Township, Menominee County, Michigan. The project includes an open pit mine, beneficiation facilities, and tailings management facilities encompassed within the project area. Water discharge is required since water demands of the milling facility are exceeded by water sources available from precipitation and mine water inflow. Excess water is to be treated and discharged through a discharge pipe/outfall directly to the Menominee River adjacent to the project.

### Endangered Species Act Comments

#### **Northern long-eared bat**

A review of information in our files indicates the presence of federally threatened northern long-eared bats (NLEB). During the summer, NLEBs (*Myotis septentrionalis*) typically roost singly or

in colonies underneath bark or in cavities, crevices, or hollows of both live and dead trees and/or snags (typically  $\geq 3$  inches dbh). This species has also been found roosting in structures such as barns and sheds occasionally (particularly when suitable tree roosts are unavailable). These bats forage for insects in upland and lowland woodlots and tree-lined corridors. During the winter, NLEBs hibernate predominantly in caves and abandoned mine portals.

On April 2, 2015, a final rule was published in the Federal Register listing the NLEB as threatened, along with an interim species-specific rule under section 4(d) of the Act, which lessens ESA restrictions that do not provide conservation benefits for the bat. On January 14, 2016, a final species-specific 4(d) rule was published in the Federal Register, further reducing restrictions that do not provide conservation benefits to the species. Incidental take is only prohibited under the final rule as a result of removing a known occupied maternity roost tree or removing trees within 150 feet of a known occupied maternity roost tree during the pup season, from June 1 through July 31, or as a result of removing trees from within 0.25 miles of a hibernaculum at any time of year.

Should the project be modified or new information become available that indicates listed species or species proposed for listing may be affected, our office should be contacted.

#### Trust Resource Species Comments

Lake sturgeon (*Acipenser fulvescens*) inhabit large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins, including the Menominee River. Lake sturgeon are listed as threatened under the State of Michigan's Endangered Species Act (MCL 324.3605, 1994 PA 451) and are listed as threatened or endangered by 19 of the 20 states within its original range in the United States. Lake sturgeon can be considered a nearshore, warmwater species with water temperatures and depth preferences of low 50s to mid-60s (F) and 15-30 feet, respectively. These fish are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Adult sturgeon habitually return to spawn in streams where they were born, often migrating long distances up rivers in the spring. After hatching, young sturgeon typically remain in their natal rivers for their first summer of life.

The U.S. Fish and Wildlife Service has been involved in extensive restoration efforts for lake sturgeon in the Menominee River, which includes providing fish passage for sturgeon up- and downriver of existing dams. Efforts to ensure the health and continued recovery of the species and the river that supports them have been a high priority to the Service, and many projects and partners have been involved to ensure long-term success of the species.

Sturgeon restoration on the Menominee River has required a cooperative team approach between several departments or programs within the states of Wisconsin and Michigan, the USFWS, non-

government organizations such as the River Alliance of Wisconsin and Michigan Hydro Relicensing Coalition, as well as important involvement and buy-in from private hydroelectric companies.

Recent estimates of adult lake sturgeon indicate that there are approximately 570 adults between the White Rapids and Grand Rapids dams on the Menominee River (Ed Baker, Michigan Department of Natural Resources; Mike Donofrio, Wisconsin Department of Natural Resources). The mine outfall would be approximately 3 miles downstream of the White Rapids Dam. Reintroduction of lake sturgeon upstream of the White Rapids Dam is currently ongoing (Mike Donofrio) and additional lake sturgeon reside in the river sections downstream of the Grand Rapids Dam.

The goals and objectives for these projects span a 50 year timeframe and management will be ongoing beyond this time frame. We would be concerned about any development in the watershed that could significantly harm the water quality of the Menominee River and thus reduce the viability and success of sturgeon reproduction, growth, survival, or health.

We are concerned at the lack of information provided regarding the types and amounts of contaminants that could be discharged from the Back Forty project into the Menominee River. Additionally, we are concerned that the preventative measures and adaptive management plans to prevent contamination or unanticipated discharge may falter after an extended period of time and/or would not be sufficient to impede contamination from occurring. Specifically, there are missing details about the designs and longevity of the tailings management facilities, contact water basins, and the river pillar/cut off wall. Increased frequency of heavy rain events have been documented in the United States (Walsh *et al.* 2014) and should be considered in design plans. For example, on July 12, 2016, 8 to 12 inches of rain fell in a matter of hours across northern Wisconsin, causing widespread flooding (<http://readywisconsin.wi.gov/>).

### Toxicity Testing

Toxicity testing is required as part of the wastewater discharge permit application. A 48-hour LC50 or EC50 test for a North American freshwater planktonic crustacean is required for discharge that contains water treatment additives (WTAs). The result of a toxicity test that meet the minimum requirements of R 323, 1057(2)(a) of the Water Quality Standards are required for one other North American Freshwater aquatic species (other than a planktonic crustacean). Whole effluent toxicity (WET) tests are required for discharge(s) or receiving water(s) in relation to the facility's discharge every three years. Aquila Resources is planning on conducting acute toxicity tests on the effluent using *Ceriodaphnia dubia* and fathead minnows (*Pimephales promelas*). WET testing will be conducted once the facility is constructed.

There is abundant information in scientific literature on the sensitivity of freshwater mussels and fish to copper (Cu) toxicity. Mussel larvae (glochidia) and juveniles are more sensitive than adult mussels or fish. Therefore, we recommend that glochidia of three unionoid species be included in the toxicity testing. These species would include ellipse (*Venustachaconcha ellipsiformis*), fatmucket (*Lampsilis siliquoidea*), and one other unionoid mussel species commonly found in the Menominee River.

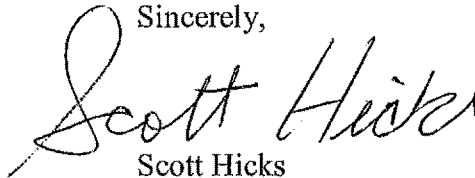
Previous scientific literature cites that fish will actively avoid areas with concentrations of Cu and zinc (Zn) that are below lethal concentrations, effectively making the area uninhabitable for fish (Saunders and Sprague 1967; Sprague 1964; Sprague 1968). Literature has shown that in greater concentrations, Cu impairs the olfactory system function in fish and damages olfactory tissue structures (Hansen *et al.* 1999a; Hansen *et al.* 1999b). This can lead to the decreased ability to imprint on homing streams, find food, and avoid predators (Hara 1986; Hara 1994; Hara *et al.* 1983). Since fish used in testing cannot escape their tanks, the Service finds this knowledge of avoidance mechanisms valuable to the understanding that even if Cu and Zn concentrations are at a non-lethal level, fish habitat may still be impacted. Given the amount of resources directed at lake sturgeon habitat restoration, a loss of potential habitat due to contaminants would be setback to the conservation of this species. Glochidia also rely on host fish, such as logperch, to attach to and become juveniles. A loss of host fish to an area of habitat would result in an unintended loss of mussels to that area as well.

#### Summary Comments

We recommend that the applicant include freshwater mussel glochidia to the WET 96 hr. testing. We also recommend that lake sturgeon movement and relative abundance be evaluated before, while, and after mining activities occur in order to determine whether mine effluent has reduced lake sturgeon habitat or may be inhibiting movement upstream. We also recommend the applicant identify an adaptive management plan and funding assurances to further remediate any effluent in order to fully address these potential impacts. In order to more accurately assess risk to aquatic species and habitat, we request more detailed information about the designs and longevity of the tailings management facilities, contact water basins, and the river pillar/cut off wall. We also request a more detailed storm water management plan that considers significant flooding events and how this would impact the concentrations of contaminants and types of contaminants released into the Menominee River.

We appreciate the opportunity to provide our resource protection recommendations. For further discussion, please contact Lisa Kaulfersch of this office at (517)-351-5293 or by email at [lisa\\_kaulfersch@fws.gov](mailto:lisa_kaulfersch@fws.gov).

Sincerely,



Scott Hicks  
Field Supervisor

cc: USEPA, Region 5 (Attn: Melanie Burdick)  
USEAP, Region 5 (Attn: Krista McKim)

#### References

Hansen JA, Rose JD, Jenkins RA, Gerow KG, Bergman HL. 1999a. Chinook salmon (*Oncorhynchus tshawytscha*) and rainbow trout (*Oncorhynchus mykiss*) exposed to copper: Neurophysiological and histological effects on the olfactory system. *Environmental Toxicology and Chemistry* 18:1979-1991.

Hansen JA, Woodward DF, Little EE, DeLonay AJ, Bergman HL. 1999b. Behavioral avoidance: Possible mechanism for explaining abundance and distribution of trout species in a metal-impacted river. *Environmental Toxicology and Chemistry* 18:313-317.

Hara TJ. 1986. Role of olfaction in fish behavior. In Pilcher TJ, ed., *The Behavior of Teleost Fishes* The Johns Hopkins University Press, Baltimore, MD, USA, pp 152-176.

Hara TJ. 1994. Olfaction and gustation in fish: An overview. *Acta Physiologica Scandinavica* 152:207-217.

Hara TJ, Brown SB, Evans RE. 1983. Pollutants and chemoreception in aquatic organisms. In Nriagu JO, ed., *Aquatic Toxicology*. John Wiley & Sons, New York, NY, USA, pp 247-306.

Saunders RL and Sprague JB. 1967. Effects of copper-zinc mining pollution on a spawning migration of Atlantic salmon. *Water Research* 1:419-432.

Sprague JB. 1964. Avoidance of copper-zinc solutions by young salmon in the laboratory. *Journal of the Water Pollution Control Federation* 36:990-1004

Sprague JB. 1968. Avoidance reactions of rainbow trout to zinc sulphate solutions. *Water Research* 2:367-372.